CHAPTER 2

MANAGEMENT

2-1. Objectives.

2-1.1. Contribute forest products to the local and national economy.

2-1.2. Provide for the optimum sustained production of forest products consistent with the military mission and multiple natural resources uses, with special attention to cultural resources. (Included are protection of threatened and endangered species; and preservation of archeological and historical sites.)

2-1.3. Enhance military training facilities by providing accessible forestland cover (through proper silvicultural practices), buffer zones, recreation areas and scenic values.

2-1.4. Develop and maintain wildlife habitat within the concept of normal forest management principles.

2-2. Special Considerations.

2-2.1. Forest tree species to be featured will normally be determined by land use capabilities and military requirements. The selection may be altered to provide optimum barriers, camouflage, screening, aesthetics, wildlife habitat, and special training.

2-2.2. Construction project plans and specifications will include provisions for timely removal of all merchantable timber. Under emergency, or short notice situations merchantable timber will be stockpiled for disposal by timber sale.

2-2.3 Maintain seed trees on impact areas whenever practical.

2-2.4. The hazards of fire and explosion, and metal in the timber on military installations are far greater than in commercial forestlands. Management and disposal operations must consider these hazards.

2-2.5. Guidance for disposal of contaminated timber is as follows:

2-2.5.1. Standing timber which has been contaminated with military metal (bullets, shrapnel, etc.) should be removed by harvesting if at all possible.

2-2.5.2. Heavily contaminated trees may be used for military training exercises where whole material is required. Less contaminated trees may be disposed of by sale for poles, piling and posts. Areas with light or scattered contamination will be made available for lumber products and pulpwood. Knowledge of, or probability of, metal contamination should be made known at the time the declaration of availability is submitted. Lead bullets do not normally affect merchantability but may reduce the stumpage price. Some wood-using industries have installed metal detectors at the mill, but portable detectors may be used successfully by harvest contractors. Metal detectors may be provided for use on sales known to contain metal contamination.

2-2.5.3. Following unsuccessful attempts to dispose of contaminated timber through normal harvesting, consideration should be given to deadening contaminated timber (when not required for seed trees) prior to regeneration. Such action should be limited to managed forest land not planned for military firing range use in the foreseeable future.

2-2.6. Safety considerations will be included in all aspects of forest management to insure the safety of personnel participating in the forest management program. Safety guidelines are contained in appendix D, No. 3.

2-3. Personnel. The personnel requirements vary with the forest acreage, complexity of management, volume and value of timber, and difficulties involved in maintaining protection from fire, insect, and disease. (Appendix E is a guide for determining requirements for personnel and equipment.)

2-3.1. Personnel are encouraged to attend professional meetings, seminars, or short courses offered by universities, U.S. Forest Service and other organizations to keep abreast with current developments and techniques of forest management.

2-3.2. The workshop method is an excellent procedure for training foresters. The workshop is not a substitute for on-the-job training, but serves as a means of improving overall techniques of protection and management, introducing new equipment, and demonstrating better methods of equipment use. The workshop should be conducted at an installation having an active forest management program and suitable quarters for visitors.

2-3.3. On-the-job training by doing, supported by

lectures, charts, and demonstrations, is essential at the installation level. When feasible, invite specialists from state and Federal agencies to assist with lectures and demonstrations.

2-4. Planning.

2-4.1. General. The first step in management is to develop the written plan. Air Force installations will use the Forest Management Plan format prescribed by AFR 126-1. The outline for the Forest Management Plan is presented in appendix A.

2-4.1.1. Start with preparation of the fire protection portion of the overall plan (app D, No. 3). When the Fire Protection Plan is completed and approved, develop remaining parts of the full plan.

2-4.1.2. Keep the approved management plan alive by revision and amendments.

2-4.1.3. A pressboard binder which will hold the entire plan including the maps and charts offers a satisfactory means of presenting, protecting, and filing the completed plan.

2-4.2. Steps in preparing the plan.

2-4.2.1. Base map. Select a suitable base map. Aerial mosaics make very useful base maps. Military quadrangle sheets and/or geological survey maps may be necessary to coordinate all activities. These provide military training coordinates, public land survey designations for coordinating fire data with state towers, and necessary contours and elevations.

2-4.2.2. Aerial photographs. For assistance in obtaining photographs see Timber Inventory (app. B).

2-4.2.3. Land use map. Prepare a basic land use map of the reservation. On it outline improved grounds, semi-improved grounds, firing ranges, impact areas, antenna fields, ammunition storage areas, and other land areas not in the forest category. The remaining area is the forestland to be placed under management. Determine the overall forest acreage by planimeter, modified acreage grid, or other suitable method.

2-4.2.4. Forest stand map. A stand map is justified when—

2-4.2.4.1. There are two or more easily recognized major forest type groups. Example: Upland pine and bottomland hardwood.

2-4.2.4.2. Broad age classes of even-aged stands exist over extensive areas. For most localities, the following stand-size classes are sufficient: sawtimber stands, pole timber stands, seedling and sapling stands, and nonstocked areas. Age classes may be used to supplement the stand-size classification. The merchantability and volume in each stand-size class depends on timber type and site class.

2-4.2.4.3. There are pronounced differences in conditions that have resulted from burning, cutting, thinning, or other practices:

2-4.2.4.3.1. The minimum stand to be recognized generally, is 10 acres of productive forest. (This acreage may be reduced as necessary to include special areas, e.g., black walnut). Prepare stand maps from aerial photos by photo interpretation techniques if trained personnel and special equipment are available. Request assistance from the nearest forest experiment station or regional office of the Forest Service, U.S. Department of Agriculture, or use ground reconnaissance and map sketching with the help of aerial photos.

2-4.2.4.3.2. In determining condition classes to be recognized, it is better to have a few condition classes which are useful in locating and managing timber than to have too many.

2-4.2.5. The cutting cycle. Establish the cutting cycle. This is the planned period within which all compartments (app B) producing merchantable timber are cut over once, in orderly sequence.

2-4.2.5.1. Different cutting cycles for different species are not necessary; adjust essential differences in treatment of various species by changing the marking rules (para 2-5 below).

2-5.2.5.2. Establish the cutting cycle as 10 years for the initial stages of management, when not determined by other methods.

2-4.2.6. Compartment determination. Select compartments and define on a map (app B). Compartments are subdivisions of the forestland established for purposes of orientation, administration, protection, and silvicultural operations, and defined by permanent or semipermanent boundaries. The boundaries may be natural features or manmade lines, which do not necessarily coincide with stand boundaries.

2-4.2.6.1. Number of compartments. The number of compartments established will be 5 to 10, depending on the growth rate. They should be approximately equal in area, if this is feasible. Use roads, streams, reservation boundaries, and other clearly defined physical lines as the compartment boundaries. Use legal subdivisions if convenient. Military subdivisions are useful in some instances.

2-4.2.6.2. Order of cutting. After the compartments have been established, determine the order of cutting on the basis of worst first silvicultural need. Designate the compartment most in need of cutting as "Compartment I," the next as "Compartment II," and so on. If new construction

or other developments eliminate from the forestland all or a large portion of a compartment, that compartment may be dropped. The forest acreage remaining is added to the area of an adjacent compartment.

2-4.2.7. Cutting units. Cutting units are subdivisions of the compartment usually about 40 acres in area. In the case of stand management, individual stands will substitute for cutting units, regardless of their size. Cutting units, or stands, increase efficiency in timber marking and estimating, provide identifiable units for work assignments, are useful in describing fire locations, and in recordkeeping. Delineate cutting units or stands on the compartment map and on the ground, and identify by numbers.

2-4.2.8. Timber inventory. An approximation of the volume is essential to long-range planning. It is important to know what is available in terms of products to be produced, where the volumes are located, priorities of harvest or cultural treatments, and the prospective productivity. Appendix B provides guidelines for preparing a Timber Inventory.

2-4.3. Plans for Small Forestlands. The following modifications of the management practices outlined for larger installations may be made for small forests:

2-4.3.1. The forest area should be divided into compartments and a 5- to 10-year cutting cycle used where practical. If the forest occurs in several scattered blocks, they may be identified as compartments, for reference purposes.

2-4.3.2. Annual harvests can be planned if the area is large enough or it may be satisfactory and more profitable to prescribe periodic instead of annual harvests. Harvest should be planned with sufficient volume per acre to attract competitive bids.

2-4.3.3. Neither the absence of an installation forester nor the use of periodic harvests need lessen the quality of marking and other forest care. Obtain professional services from higher levels, or request assistance from State or Federal foresters, or use professional consultant forester services contracts. Teach marking rules to non-professional personnel, and prepare a work program covering a period of several years.

2-4.3.4. On smaller installations, wildfire occurrence is at a lower frequency than on larger installations and protection practices should be modified.

2-4.4. Annual Work Plan. In advance of each fiscal year prepare a work plan which describes the types and magnitude of work to be performed during the ensuing year. A copy of the annual work plan should be made a part of the forest management plan (app A).

2-4.5. Revising the Forest Management Plan:

2-4.5.1. Annual revisions. The purpose of annual revisions is to furnish revised data to support actions proposed in the plan, and to correct information furnished originally. Page revisions normally are adequate for corrections; changes in personnel requirements; and record of fires, and estimated damage (acres and value) resulting thereform. Page revisions should be inserted in the installation forest management plan, and a copy forwarded to appropriate headquarters.

2-4.5.2. Complete revisions. An active forest management program on an installation normally requires periodic complete revision of the plan. Five-year intervals are usually desirable. However, 10-year intervals are frequently used within the Air Force, Navy, and Marine Corps. These revisions should summarize the data furnished in the original plan and subsequent annual revisions. Other items may include: revised compartmentation and cutting units, and changes in marking rules and cutting budgets. Complete revision may require fieldwork, especially when new rates of growth and volume determinations and stand mapping are needed.

2-5. Timber Sales Procedure.

2-5.1. General. Remove from the stand those trees which would otherwise be wasted by death and decay, or will interfere with the growth rate or survival of more desirable trees. There are three primary methods for eliminating such trees:

2-5.1.1. Commercial sale. This is the principal method of preventing waste and improving the stand.

2-5.1.2. Timber stand improvement, by cutting or deadening undesirable trees and species. No utilization is attempted, unless there is a local demand for firewood.

2-5.1.3. Installation utilization, by cutting and removing marked trees in the course of training or by use of grounds maintenance crews.

2-5.2. Timber Cutting Designation. Trees to be removed will be selected in advance and designated by marking, specifying diameter limits, or area boundary designation. Develop marking rules in writing for each type of intermediate and harvest cutting. The following guidelines apply:

2-5.2.1. Mark for removal the following classes of trees (Fig. 2-1).

2-5.2.1.1. Sanitation Trees. Those trees in which the presence of wood destroying fungi are unmistakably evident. Sanitation trees will be retained

only when better trees are not available and seed trees are essential.

2-5.2.1.2. Poor risk trees. Included are those in which the loss of marketable wood currently exceeds the annual growth of new wood; those which are overmature and suppressed, unthrifty due to insect or fungus attack, or weakened mechanically and subject to windthrow; and those damaged by fire, turpentining, lightening, logging, or insects. Poor risk trees may be left as seed trees when no better trees are available.

2-5.2.1.3. Mature trees. Trees which have just passed the peak of annual growth and natural vigor as indicated by crown appearance and by increment borings. Removal of these trees will be dictated by the method of regeneration designated in the forest management plan.

2-5.2.1.4. Thinnings. Those trees of marketable size that are least desirable and should be removed to give proper growing space to better trees.

2-5.2.1.5. Culls and undesirable species. Those trees of merchantable size which are considered to be unmerchantable or are of undesirable species. As an exception, individuals of undesirable species if thrifty, of high quality, and not in competition with better trees may be retained for possible future demand.

2-5.2.1.6. Metal contaminated timber (See para 2-2).

2-5.2.2. Environmental considerations in timber marking. During timber marking and harvesting operations, consideration must be given to: enhancing wildlife habitat, aesthetic values, outdoor recreation benefits, watersheds, protection of endangered and threatened species of fauna and flora and their critical habitats, and to protecting special interest areas.

2-5.2.2.1. Wildlife habitat. Normally, wildlife habitat enhancement should be considered during all marking operations. Active den trees should be left for squirrel, raccoon, wood ducks, red-cockaded woodpeckers, and owls. Bird rookeries should be left uncut. Consideration will be given to leaving desirable food trees such as oak, hickory, beech, black gum, black walnut, pecan, cherry, persimmon, dogwood, crabapple, and hawthorne, preferably in groups. The maintenance of groups of hardwoods in Southern pine forests is more beneficial to wildlife than leaving a few scattered individual hardwoods. Small openings from three to five acres in size should be established in dense canopy forests for turkey, grouse, deer, and cottontail. Dead trees and snags should be left standing to provide food and shelter for many small wildlife species including song birds, unless they create hazardous conditions for forest destroying insects, disease, and lighting strike fires. During intermediate markings for pine thinning maintain a semi-open canopy by cutting back sufficiently to stimulate a faster growth rate on the residual trees thus allowing sunlight to reach the forest floor. This in turn stimulates growth of grasses, forbs, and woody vegetation, providing desirable food and cover for deer, turkey, grouse, quail, cottontail, and song birds. Refer to the installation fish and wildlife management plan for specific wildlife requirements.

2-5.2.2.2. Aesthetic values. Aesthetic values must be taken into consideration when marking trees along heavily traveled roads and highways, in cantonment areas, and adjacent to lakes and streams. Normally, only light cuttings are made along the edge or sight zone of these scenic areas.

2-5.2.2.3. Outdoor recreation benefits. Special marking will be made in outdoor recreation areas to enhance these values. Marking may be limited to those trees which are susceptible to wind breakage or to open up dense stands for optimum crown development. Outdoor recreation areas include picnic areas, camping sites, hiking and jogging trails, bird watching and nature trails, and ski slopes. Refer to the installation outdoor recreation plan for specific requirements.

2-5.2.2.4. Watersheds. Normally, only light thinnings or harvest cuttings are made on watersheds to prevent erosion, heavy runoff, siltation and contamination. Care must be taken when marking trees in reservoir watershed areas. Buffer zones shall be established and maintained along all principal streams and water bodies.

2-5.2.2.5. Endangered and threatened species. When marking trees in areas which contain endangered or threatened species of fauna or flora, special care must be exercised to protect and/or enhance these species. When habitat for an endangered species is located on the installation, complete protection of the site may be required. (Ref Section 7 of the Endangered Species Act of 1973). When endangered or threatened species are involved, formal consultation must be made with appropriate state and U. S. Department of the Interior personnel to determine if any timber cutting is allowed in and adjacent to those areas.

2-5.2.2.6. Special interest areas. The presence of special interest areas (archaeological, botantical, ecological, geological, and historical) will also determine the intensity of marking and cutting. Some sites such as natural areas will require no timber cutting. Refer to the installation outdoor recreation plan concerning the location and specific requirements for these special interest areas.

2-5.3. Timber Harvesting. Commercial Sales:

2-5.3.1. Written release. For land leased from

private owners, the real estate officer must secure written approval of the lessor unless specifically permitted by the lease.

2-5.3.2. Map. Prepare a reproducible map to delineate the cutting area. Show all economically operable areas, danger areas, off-limit areas, live firing range boundaries, main roads, wood roads, firebreaks, streams, available mill sites (if any), compartment and cutting unit identification, and any other features important is logging, hauling, and milling operations.

2-5.3.3. Marking. Trees marked for removal shall be designated with tree marking paint (fig. 2-2).

2-5.3.3.1. In selective cutting every tree to be removed is marked at breast height (4 1/2 to 5 feet above ground) and on the stump at ground line. Use only one color of paint (yellow as a rule), and face all marks in the same direction (Fig. 2-3).

2-5.3.3.2. When an area is to be clear cut to remove all merchantable timber, mark only the boundary trees. Place the marks 5 feet high facing into the tract to be cut. Do not cut boundary trees.

2-5.3.4. Volume estimates.

2-5.3.4.1 Obtain the volume estimate as the trees are marked. If the stand is to be clear cut, marking is unnecessary, but the volume of merchantable timber must be determined and documented.

2-5.3.4.2. Compute volumes separately for major species and product utilization.

2-5.3.4.3. For species of lesser value, combine volumes into "mixed conifers" or "mixed hardwoods."

2-5.3.4.4. The estimate should be sufficiently accurate to provide appraisal data.

2-5.3.5. Statements of availability. When required prepare a declaration of availability (APP C) for submission to the designated approval authority.

2-5.3.6. Merchantability. Clearly define the merchantability standards used for volume determination of various species and products. The following are examples.

2-5.3.6.1. Logs. A merchantable pine sawlog is defined as being not less than 8 feet long and 6 inches inside bark at the small end. A hardwood log is at least 8 feet long and no less than 10 inches in diameter inside bark at the small end.

NOTE: Logs are generally considered unmerchantable if net scale is less than one-third of gross scale.

2-5.3.6.2. Trees. A merchantable sawtimber tree is defined as containing at least one merchantable sawlog. A merchantable pulpwood tree must produce in the stem no less than two pulpwood bolts 5 feet long and no less than 4 inches inside bark at the small end.

Note: Local practices may require consideration of other specifications.

2-5.3.7. Other conditions. Other conditions to be included in the scale specifications are:

2-5.3.7.1. How slash and tops are to be disposed of, if necessary, and expected standards of performance.

2-5.3.7.2. Time period or date by which cutting must be completed. This is especially important for "crash" programs necessary to clear land, stop insect attacks, or salvage storm damaged timber. Ordinarily the contract period should provide ample time to permit completion as determined by local practices without conflict with anticipated military training.

2-5.3.7.3. Explain if loggers will be permitted to operate only on specified days of the week.

2-5.3.7.4. Provision for penalty payments for logging damage to other standing trees, drainage systems, roads, firebreaks, and the like.

2-6. Management Records. Adopt a system to provide a useful, easy-to-understand, and economical-to-maintain record of the annual accomplishments.

2-6.1. A written record will be maintained.

2-6.1.1. For each management unit:

2-6.1.1.1. Installation identification and locations.

2-6.1.1.2. The fiscal years covered by the record.

2-6.1.1.3. The name or number of compartment and cutting unit to which the record pertains.

2-6.1.1.4. The gross and managed forest acreage in the unit.

2-6.1.1.5. Products removed, by type and volume.

2-6.1.1.6. Contract numbers, if removed by scale or harvest.

2-6.1.1.7. Timber sale receipt information.

2-6.1.1.8. Reforestation record in acres, number of trees planted, percent surviving, acres remaining to be planted.

2-6.1.1.9. Record timber stand improvement, control of insects and disease and other management activities.

2-6.1.2. Record costs by fiscal years including sale administrative costs.

2-6.2. Management Map. (The fire record is maintained on a separate map, as described in APP D, No. 3) The management map should be color coded to show:

2-6.2.1. The compartments and planned year for cutting.

2-6.2.2. The areas marked.

2-6.2.3. The areas reported available for disposal.

2-6.2.4. The areas assigned for installation cutting, including troop training and other post needs.

2-6.2.5. Progress of cutting.

2-6.2.6. Reforestation planned.

2-6.2.7. Reforestation completed.

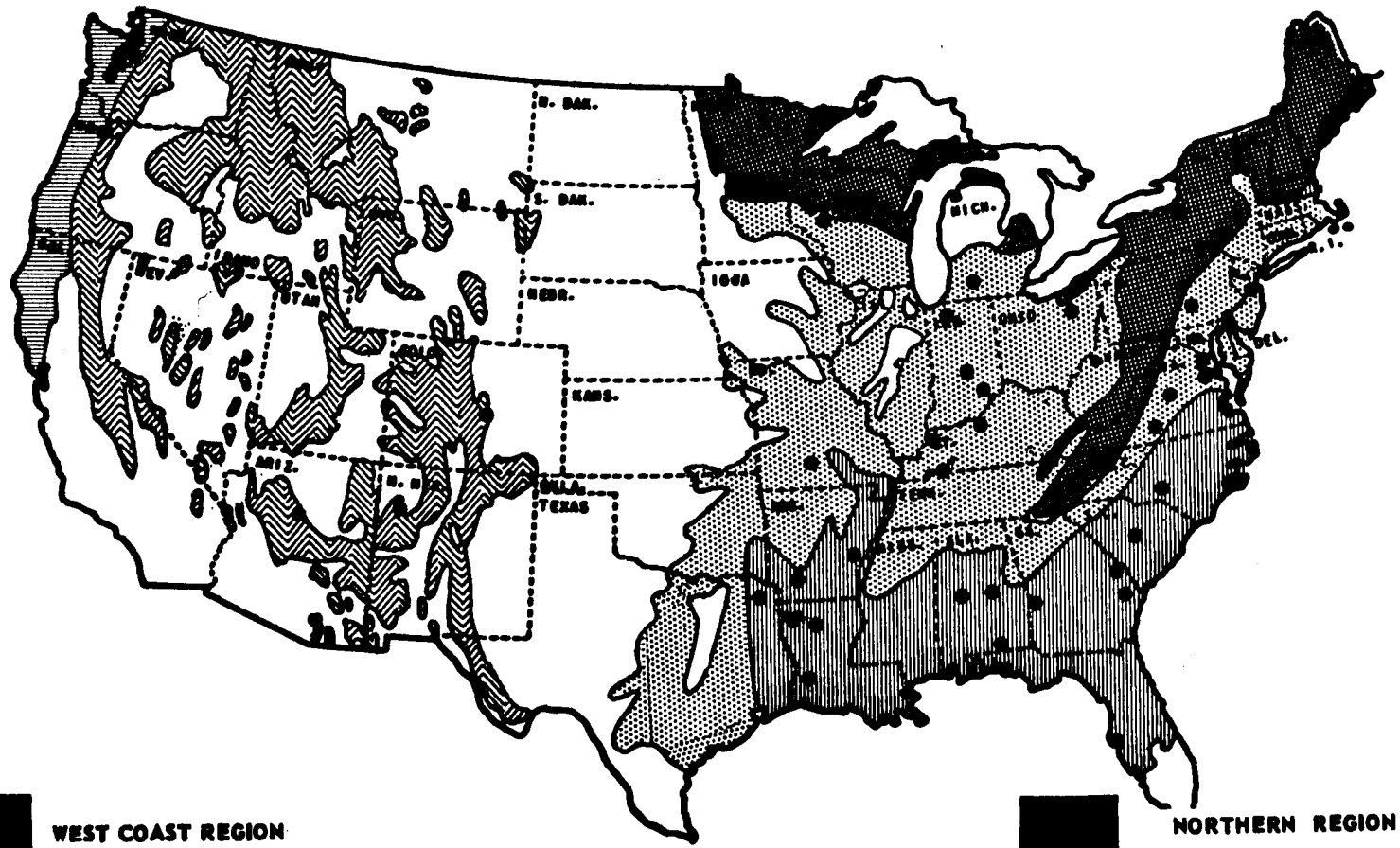
2-6.2.8. Timber stand improvement planned.

2-6.2.9. Timber stand improvement completed.

2-6.2.10. Volume records.

Note: Air Force, Navy, and Marine personnel refer to AFR 126-1/NAVFAC INST 11015.9A/MCO P-11000.8.

2-6.3. Tabular Aids. Miscellaneous data such as measurement equivalents, weights of commercially important woods and conversion factors are presented in appendices F to J inclusive.



WEST COAST REGION

Douglas fir; western hemlock; redwood; western red cedar; Sitka spruce; sugar pine; lodgepole pine; incense cedar; white fir; Port Orford cedar; and others.

WESTERN REGION

Ponderosa pine; Idaho white pine; western larch; Engelmann spruce; Douglas fir; lodgepole pine; sugar pine; western red cedar; western hemlock; white fir; and others.

CENTRAL REGION

Northern portion - oaks; hickories; ashes; elms; maples; beech; black walnut; pitch; shortleaf and Virginia pines, cottonwood; and others.

NORTHERN REGION

Red, black and white spruces; balsam fir; white, red, jack and pitch pines; eastern hemlock; maples, oaks, beech birches, aspen.

SOUTHERN REGION

Longleaf, shortleaf, loblolly and slash pines; southern oaks; red gum; hickories; southern cypress; eastern and southern red cedars; and others.

Figure 2-1. Types of cuttings.

Figure 2-2. Paint marking tree

Figure 2-3. Young Southern Yellow Pine stand before thinning.